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ABSTRACT

This document consists of a brief project report and a manual developed by the Adult Learners' Training and Assistance Program. The report describes how instructors at Luzerne County Community College (Pennsylvania) learned about the basic/essential elements of cooperative learning by actively experiencing cooperative learning instructional sessions. Three staff development sessions covered the following topics: cooperative learning, team building, and cooperative learning structures and techniques; basic elements of effective cooperative learning; immersing instructional staff within cooperative learning structures and techniques; benefits of cooperative learning; instructional activities appropriate for cooperative learning; planning a cooperative learning lesson; and making organizational decisions for a cooperative learning session. The instructors participated in a peer review of cooperative learning sessions and contributed a learning script, including handouts, to a cooperative learning manual. The manual begins with a description of the cooperative learning structure or technique, placed before the directions for the activity to encourage manual users to create additional activities appropriate to the needs of the adult learners to whom they provide literacy services. Components of each learning activity include some or all of the following: structure; directions for structure; basic elements employed; lesson title with content area(s), category, and time; directions for activity; additional ideas; handout recommendations; text suggestions; and handout(s). (YLB)

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Cooperative Learning Staff Development

Project Director: Margaret Elin Rood, Director Adult Learner's Training and Assistance Program
Luzerne County Community College
1333 S Prospect St
Nanticoke, PA 18634-3899
1-800-377-5222 Ext 413

Fiscal Year 1997-98

$3,750 Project No.: 99-8010

Final Report

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ABSTRACT PAGE Project No.: 99-8010

Grant Recipient: Luzerne County Community College
1333 S Prospect Street
Nanticoke, PA 18634-3899

Program Name: Cooperative Learning Staff Development

Grant Allocation: $3, 750

Project Period: July 1, 1997 through June 30, 1998

Project Director: Margaret Elin Rood

Project Purpose: The project proposed to immerse instructional staff in cooperative learning structures and techniques. In addition, the project proposed to have instructional staff participate in a peer review of cooperative learning sessions and contribute a learning script to a cooperative learning manual.

Project Outcomes: The Adult Learners' Training and Assistance Program instructors at Luzerne County Community College learned about the basic/essential elements of cooperative learning by actively experiencing cooperative learning instructional sessions. In addition, Adult Learners' Training and Assistance Program instructors participated in a peer review of cooperative learning sessions and contributed a learning script including handouts to a cooperative learning manual.

Impact:

- Three cooperative learning staff development sessions were held for professional staff within the Adult Learners' Training and Assistance Program.
- Professional staff participated in a peer review of cooperative learning sessions.
- Adult Learners' Training and Assistance Program instructors contributed a learning script including handouts to a cooperative learning manual.

Product or Training Developed: Three cooperative learning staff development sessions for professional staff within the Adult Learners' Training and Assistance Program were developed and presented.

Products Available From: Adult Learners' Training and Assistance Program instructors contributed a learning script including handouts to a cooperative learning manual.

Project Continuation and/or Future Implications: The multiple outcomes of using cooperative learning structures and techniques within adult education programs make cooperative learning one of the most important tools educators have. Cooperation compared with individualistic

efforts typically results in higher achievement, greater retention, and greater social competence, and self-esteem. Furthermore, implementation of cooperative leaning structures teaches teamwork skills which are so vital for adult learners to carry over to the workplace. Therefore, it is imperative that tracking and follow up efforts be conducted to ensure that the cooperative learning structures presented and employed within this project are continually being implemented in the adult learners' instructional setting(s). Tracking and follow up can include but are not limited to the following activities: additional cooperative learning staff development sessions; additional peer review monitoring sessions; and formal and informal surveying of instructional implementation of cooperative learning structures and techniques.

Conclusions/Recommendations: The three fold staff development plan was essential to follow through by instructional staff to implement cooperative learning structures and techniques: (1) immersion within cooperative learning activities; (2) peer monitoring and review; and (3) contributing to a cooperative learning manual.

Additional Comments: N/A

Cooperative Learning Staff Development
Final Report Fiscal Year 1997-98

The project proposed to immerse instructional staff in cooperative learning structures and techniques. In addition, the project proposed to have instructional staff participate in a peer review of cooperative learning sessions and contribute a learning script to a cooperative learning manual.

The rationale from which the project emerged was based on research and implementation of cooperative learning structures within instructional sessions by the director. Wanting to see the benefits of cooperative learning sessions brought into all of the local adult learners' instructional sessions, the director created this project.

Three staff development sessions were held for during the months of January and February of 1998. The staff development sessions included:

- Introducing cooperative learning, team building, and a variety of cooperative learning structures and techniques.
- Describing the basic elements of effective cooperative learning.
- Immersing instructional staff within cooperative learning structures and techniques.
- Identifying and giving examples of the benefits of cooperative learning.
- Identifying instructional activities appropriate for cooperative learning.
- Planning a cooperative learning lesson.
- Reviewing the basic elements of cooperative learning.
- Making organizational decisions for a cooperative learning session.
- Reviewing the peer evaluation process.

During the month of March, 1998, Adult Learners' Training and Assistance Program instructors participated in a peer review process. Each instructor was assigned to observe another instructor's cooperative learning instructional session and complete the Peer Review form (see attachment). Adult Literacy Training and Assistance Program instructors contributed a cooperative learning script including appropriate handouts to a cooperative learning manual. The scripts and handouts were completed by May, 1998.

Instructional staff who participated in this project provide instruction to adult learners' who are within the following level categories: preliterate (0-1); beginning adult basic education (2-5); intermediate adult basic education(6-8); GED preparation (9-12); and preliterate, beginning, and intermediate English as a Second Language learners.

The sources of dissemination of this project are listed below:

Bureau of Adult Basic and Literacy Education
Pennsylvania Department of Education
333 Market St - 12th floor
Harrisburg, PA 17126-0333

AdvancE State Literacy Resource Center
PDE Resource Center
333 Market St - 11th floor
Harrisburg, PA 17126-0333
(800) 992-2283

Implementation of cooperative learning techniques teaches teamwork skills which are so vital for our students to carry over to the workplace. The Creative Education Foundation (1990) in the article, *Creativity in Action,* reports that the following skills are desired by the Fortune 500 Companies: teamwork, problem solving, interpersonal skills, oral communication, listening, creative thinking, leadership, writing, computation, and reading. Implementation of cooperative learning strategies allows instructors to work towards development of all these skills.

Moreover, the multiple outcomes of using cooperative learning structures and techniques within adult education programs makes cooperative learning one of the most important tools educators have. Cooperation compared with individualistic efforts typically result in higher achievement, greater retention, and greater social competence and self-esteem.

Cooperative Learning structures ensure that students participate in team activities that encourage speaking, reading, writing, and communication skills. The beneficial educational outcomes of cooperative learning groups are due to the interaction patterns and verbal exchanges that take place among students. Oral summarizing, giving and receiving explanations, and elaborating (relating what is being learned to previous learning) are important types of verbal interchanges.

Program participants are placed in cooperative learning groups heterogeneously by the instructors. So the groups are made up of students of different abilities, ethnic backgrounds, gender, perspectives, and language. The students have different strengths and weaknesses and along with their diversity these heterogeneous groups are powerful learning teams.

From the research on cooperative learning, we know that cooperation typically results in higher achievement, more positive relationships, and greater self-esteem. All of these outcomes are related to retention.

The design and presentation of the cooperative learning staff development sessions included the essential basic elements. Many adult literacy instructors report that when they have put students in groups, the students fail to work together, are reluctant to participate, or only one or two people did all the work. However, putting students in groups will not enhance student learning and increase their success if cooperative learning is not used effectively. The basic elements that make cooperation work must be precisely structured into every learning group. The staff development sessions modeled effective cooperative learning sessions for adult literacy service providers that included the following essential basic elements:

- **Positive Interdependence** - Students must feel that they need each other in order to complete the group's task, that they "sink or swim", together. Some ways to create this

feeling are through establishing mutual goals, joint rewards, shared materials and information, and assigned roles (summarize, encourager of participation, elaborator).

- **Face-to-Face Interaction** - The beneficial educational outcomes of cooperative learning groups are due to the interaction patterns and verbal exchanges that take place among students. Oral summarizing, giving and receiving explanations, and elaborating (relating what is being learned to previous learning) are important types of verbal interchanges.
- **Individual Accountability** - Cooperative learning groups are not successful until every member has learned the material or has helped with and understood the assignment. Thus, it is important to frequently stress and assess individual learning so that group members can appropriately support and help each other. Some ways of structuring individual accountability are by giving each group member an individual exam or by randomly selecting one member to give an answer for the entire group.
- **Interpersonal and Small Group Skills** - Students do no come to instructional settings with the social skills they need to collaborate effectively with others. So teachers need to teach the appropriate communication, leadership, trust, decision making, and conflict management skills to students and provide the motivation to use these skills in order for groups to function effectively.
- **Group Processing** - Processing means giving students the time and procedures to analyze how well their groups are functioning and how well they are using the necessary social skills. This processing helps all group members achieve while maintaining effective working relationships among members. Feedback from the teacher and student observers on how well they observed the groups working may help processing effectively.

These basic elements listed above were woven through out the cooperative learning staff development sessions.

The objectives of the project are listed below:

- Two full day cooperative learning staff development sessions for professional staff within the Adult Learner's Training and Assistance Program.
- Professional staff will participate in a peer review of cooperative learning sessions.
- Adult Learners' Training and Assistance Program instructors will contribute a learning script including handouts to a cooperative learning manual.

All objectives listed above were met; however, the two full days of staff development were redesigned to include three late afternoon through the evening sessions to accommodate instructors schedules. Nine instructors participated within the project attending the staff development sessions, monitoring and reviewing peer's cooperative learning instructional sessions, and contributing cooperative learning scripts to the manual.
The results of the three staff development sessions and the peer review and monitoring sessions can be seen in the manual on cooperative learning structures which the instructional staff contributed scripts and handouts.

The cooperative learning instructional manual with scripts and handouts have been distributed to Adult Learners' Training and Assistance Program professional staff and made available to other adult literacy service providers through submission of the manual to the Bureau of Adult Basic and Literacy Education.

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Cooperative Learning Activities for Adult Learners Manual

353 Special Project
Project No.: 99-8010

Cooperative Learning Manual Script Contributors:
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PRODUCT

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Within this manual are cooperative learning activities that were scripted by the Adult Learners' Training and Assistance Program Instructors. Structures and techniques are based on the cooperative learning structures of Spencer Kagan.

A description of the cooperative learning structure or technique has been placed before the directions for the activity. The rationale for this is to encourage manual users to create additional activities appropriate to the needs of the adult learners' with whom they provide literacy services.

As you are working with the manual, you will see that several activities are based on a jigsaw structure. Jigsaw structures ensure that the instructor can create a positively interdependent team with individually accountable team members, for each team member has a task to complete and the team is dependent on that individual's task completion.

Adult Learners' Training and Assistance Program staff encourage you and your adult learners to have fun with these activities and the cooperative learning activities you create. You will see many benefits from the implementation of cooperative learning structures and techniques. Cooperation typically results in higher achievement, more positive relationships, and greater self-esteem. All of these outcomes are related to retention.

Instructional staff who participated in this project provide instruction to adult learners' who are within the following level categories: preliterate (0-1); beginning adult basic education (2-5); intermediate adult basic education(6-8); GED preparation (9-12); and preliterate, beginning, and intermediate English as a Second Language learners.

COOPERATIVE LEARNING ACTIVITY FOR READING

Structure
Within Team Jigsaw - A cooperative learning structure in which adult learners within home teams master material to be shared with the team.

Directions for Structure
Each student from a team works independently to master material. Adult learners do a Roundrobin within teams to share the new knowledge with their teammates.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Group processing

Lesson Title: READING A SELECTION FROM *CHICKEN SOUP FOR THE SOUL*

Content Area Reading, Writing, Speaking, and Listening

Category Intermediate ABE and GED

Time 1 to 1.5 hours

Directions for Activity

1. Divide the adult learners into teams of three or four members. All adult learners were asked to read a selection from *Chicken Soup for the Soul*.

2. After the reading was finished, each adult learner was assigned a different part of the selection and asked to reread that part.

3. Adult learners participated in a Roundrobin within the teams to retell and share their part with the other members.

4. After the retelling, the adult learners were asked to write a summary using the information they received from the retelling of the selection. Adult learners were encouraged to ask the members of their team for clarifications about details.

5. Summaries were shared with the teammembers also in a Roundrobin.

COOPERATIVE LEARNING ACTIVITY FOR WRITING

Structure
Expert Jigsaw - A cooperative learning structure in which individuals become experts on a particular topic and then share their knowledge with the other team members.

Directions for Structure
Put adult learners into **home** teams. Assign a specific task to each adult learner within the team. Then have the adult learners with similar tasks form teams of their own, **expert** teams. Distribute materials, etc. Allow time for each expert team to complete their tasks. Adult learners are then asked to return to their **home** teams where they take turns sharing their newly acquired knowledge to complete a new assignment.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Team processing

Lesson Title: WRITING A PARAGRAPH

Content Area Writing

Category Intermediate ABE and GED

(Minimum requirements -compose simple sentences and identify the main idea, supporting details, and concluding statements in a written passage)

Time 2 hours

Directions for Activity

1. Briefly review main idea, supporting details, concluding statements with the class as a whole. Explain that they will write paragraphs using these elements.

2. Divide the class into **home** teams of three or four members.

3. Assign a specific element of a paragraph to each member within the home team. For example, one member is responsible for main idea statements, another for supporting details, another for concluding statements.

4. Instruct the adult learners who have similar responsibilities to leave their home team and form **expert** teams. All adult learners responsible for the main idea element will work together, all adult learners responsible for the supporting details element will work together, etc.

6. After expert teams are formed, assign members the following roles: reader; recorder; and encourager. The reader reads the handouts, the recorder writes up the expert team members responses, and the encourager encourages all members of the team to participate. The encourager often needs explicit positive examples of what needs to be said to the team to play the role. For example, the encourager

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might say to one of the team members who has refrained from sharing ideas, "And what do you think?" or "Do you think this will work?" The class can brainstorm creating positive statements, also. Their ideas are often the best and the ones which will get used.

7. Distribute handouts (see attached sheet)tc each expert team and instruct the main idea expert team to compose statements that express the main idea of each paragraph. Instruct the supporting detail expert team to compose detail statements about the topics. Instruct the concluding statement expert team to compose concluding statements. Allow enough time for all expert teams to complete this task.

8. Instruct adult learners to return to their home teams and assign each home team a separate topic. Instruct them to compose a paragraph with a clear main idea sentence, at least three supporting detail sentences, and a strong concluding sentence. Each adult learner is responsible for overseeing his/her area of expertise. Again assign roles: assign one adult learner the responsibility of being the recorder, one the encourager, and one to be the reader of the finished product to the class. If possible, the teacher can copy them or transfer them to transparencies and use the next class as a critiquing session.

Additional Ideas

This same method can be expanded to teach adult learners how to write an essay. It can also be incorporated into a reading lesson, teaching adult learners how to the main idea, etc.

Handouts

Create the following handouts:

Several paragraphs with supporting detail sentences and concluding sentences **without topic sentences**.

Several topic and concluding sentences for paragraphs **without supporting detail sentences**.

Several paragraphs with topic sentences and supporting detail sentences **without a concluding statement**.

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COOPERATIVE LEARNING ACTIVITY FOR READING AND WRITING

Structure
Roundtable - A cooperative learning structure in which individuals within a team take turns contributing possible answers to a question posed by the instructor.

Directions for Structure
The instructor asks a question with many possible answers, such as name all the sports you can, or list any items you can identify in the classroom. Teams have one piece of paper and one pen or pencil that rotate around the team. Each team member writes one answer on the list and passes the pen and paper.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction

Lesson Title: BRAINSTORMING A LIST OF HOLIDAY WORDS

Content Area Reading and Writing

Category Preliterate ABE or ESL

Time 20 minutes

Directions for Activity

1. Divide the class into teams of three or four members.

2. Give each team a large piece of paper and one colorful marker.

3. Asks the adult learners to make a list of holiday related words. Each learner writes one holiday related word on the list and passes the marker and the paper.

4. If any leaner is having difficulty thinking of what to write, the teammates can make suggestions.

5. Teams can receive recognition for various characteristics of their lists. Recognize teams with the longest word, the shortest word, the most uncommon word or any other unusual aspect to stimulate creativity.

Handouts
None

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COOPERATIVE LEARNING ACTIVITY FOR MATHEMATICS AND SCIENCE

Structure
Within Team Jigsaw - A cooperative learning activity in which adult learners within home teams master material to be shared with the team.

Directions for Structure
Each student from a team works independently to master material. Adult learners do a Roundrobin within teams to share the new knowledge with their teammates.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Group processing

Lesson Title: WIND CHILL - TABLE ANALYSIS

Content Area	Mathematics and Science
Category	GED Prep
Time	20 - 30 minutes

Directions for Activity

1. Organize the class into teams of four members. Explain that each adult learner will have a part of a wind chill table. They will work together in teams to solve the problem related to the wind chill table.

2. Each of the members will get a part of the wind chill table. As you will see from the handouts, the wind chill table has been taken apart so that there are four different handouts each having one or two columns of numbers complete with labels for the table. Distribute the wind chill handouts with one or two columns of numbers so that each member of the team receives a different part of the wind chill table.

3. Request that each adult learner in the team examine his/her handout individually and document possible answers to the questions below:
   - Question 1: What trends do you see in your data?
   - Question 2: Between what wind speeds does the largest change in wind chill take place?

4. After each team member has perused a part of the wind chill table which was assigned and documented his/her responses, distribute the wind chill table in its entirety to all members of the team.
5. Request that each learner in a roundrobin approach share with the team the data with which s/he worked and the conclusions which were drawn.

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6. Request that the team reach consensus on a statement regarding the largest change in wind chill.

7. Request that each adult learner write an interpretation of the team's response and give it to the instructor.

Additional Ideas

Other tables and charts may be analyzed using a similar procedure asking adult learners to focus on certain sections of the table - rows, columns, years, etc. With a focus on changes, adult learners might be asked to determine percent change.

Handouts

Complete Wind Chill Table (1)
Partial Windchill Tables (4)

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**50**
Wind Speed:	
No Wind	50
5 MPH	48
10 MPH	40
15 MPH	36
20 MPH	32
25 MPH	30
30 MPH	28
35 MPH	27
40 MPH	26

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**40**
Wind Speed:	
No Wind	40
5 MPH	37
10 MPH	28
15 MPH	22
20 MPH	18
25 MPH	16
30 MPH	13
35 MPH	11
40 MPH	10

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**30**
Wind Speed:	
No Wind	30
5 MPH	27
10 MPH	16
15 MPH	9
20 MPH	4
25 MPH	0
30 MPH	-2
35 MPH	-4
40 MPH	-6

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**20**
Wind Speed:	
No Wind	20
5 MPH	16
10 MPH	6
15 MPH	-5
20 MPH	-10
25 MPH	-15
30 MPH	-18
35 MPH	-20
40 MPH	-21

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**10**
Wind Speed:	
No Wind	10
5 MPH	6
10 MPH	-9
15 MPH	-18
20 MPH	-25
25 MPH	-29
30 MPH	-33
35 MPH	-35
40 MPH	-37

WIND CHILL
(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**0**
Wind Speed:	
No Wind	0
5 MPH	-5
10 MPH	-21
15 MPH	-36
20 MPH	-39
25 MPH	-44
30 MPH	-48
35 MPH	-49
40 MPH	-53

WIND CHILL
(How cold it feels)

Actual Temperature: **-10**
(degrees Fahrenheit)

Wind Speed:

No Wind	-10
5 MPH	-15
10 MPH	-33
15 MPH	-45
20 MPH	-53
25 MPH	-59
30 MPH	-63
35 MPH	-67
40 MPH	-69

10

WIND CHILL

(How cold it feels)

Actual Temperature: (degrees Fahrenheit)	**50**	**40**	**30**	**20**	**10**	**0**	**-10**
Wind Speed:							
No Wind	50	40	30	20	10	0	-10
5 MPH	48	37	27	16	6	-5	-15
10 MPH	40	28	16	6	-9	-21	-33
15 MPH	36	22	9	-5	-18	-36	-45
20 MPH	32	18	4	-10	-25	-39	-53
25 MPH	30	16	0	-15	-29	-44	-59
30 MPH	28	13	-2	-18	-33	-48	-63
35 MPH	27	11	-4	-20	-35	-49	-67
40 MPH	26	10	-6	-21	-37	-53	-69

COOPERATIVE LEARNING ACTIVITY FOR READING

Structure
Expert Jigsaw - A cooperative learning structure in which individuals become experts on a particular topic and then share their knowledge with the other team members.

Directions for Structure
Put adult learners into **home** teams. Assign a specific task to each adult learner within the team. Then have the adult learners with similar tasks form teams of their own, **expert** teams. Distribute materials, etc. Allow time for each expert team to complete their tasks. Adult learners are then asked to return to their **home** teams where they take turns sharing their newly acquired knowledge to complete a new assignment.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Team processing

Lesson Title: PRACTICE USING SHORT AND LONG VOWELS

Content Area	Reading
Category	High Beginning ABE
Time	1 hour
Materials	Create handouts or use practice exercises on short and long vowels from adult basic education text. As mentioned in the directions for this activity below, Groundwork for College Reading published by Townsend Press has a good review of phonics.

Directions for Activity

1. Briefly review short and long vowels. A good review can be found in the *Groundwork for College Reading* text published by Townsend Press. For this cooperative learning activity, the Phonics: Vowel section of the aforementioned text was utilized.

2. Divide the class into **home** teams of three members and have each home team count off by threes.

3. Assign all number ones within the **home** teams to complete a practice exercise on short vowels. Assign all number twos to complete a practice exercise on long vowels with a silent e. Assign all number threes to complete a practice exercise on long vowels with two vowels together. Pass out the practice exercises.

4. Instruct the adult learners who have similar practice exercises to leave their **home** team and form **expert** teams. All adult learners responsible for completing the practice exercise on short vowels will work together, all adult learners responsible for completing the practice exercise on long vowels with the silent e rule will work together, etc.

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6. Request that the **expert** teams complete the assigned practice exercises together keeping in mind that all adult learners will return to their **home** teams and share the skills which they mastered in the **expert** teams.

7. Instruct adult learners to return to their **home** teams and assign each **home** team a practice exercise to complete containing all three phonics rules studied: short vowels; long vowels with a silent e; and long vowels with two vowels together. Each adult learner is responsible for overseeing his/her area of expertise as **home** team members complete the review together.

Expert Jigsaw
PRACTICE USING SHORT AND LONG VOWELS

COOPERATIVE LEARNING ACTIVITY FOR ENGLISH AS A SECOND LANGUAGE

Structure
Expert Jigsaw - A cooperative learning structure in which individuals become experts on a particular topic and then share their knowledge with the other team members.

Directions for Structure
Put adult learners into **home** teams. Assign a specific task to each adult learner within the team. Then have the adult learners with similar tasks form teams of their own, **expert** teams. Distribute materials, etc. Allow time for each expert team to complete their tasks. Adult learners are then asked to return to their **home** teams where they take turns sharing their newly acquired knowledge to complete a new assignment.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Team processing

Lesson Title: CREATING HOLIDAY CALENDARS

Content Area	Listening, Speaking, Reading, and Writing
Category	Intermediate ESL
Time	4 hours

Directions for Activity

1. Briefly review names of the months, days of the week, appropriate capitalization with the whole class. In addition, briefly speak about names and different types of holidays. Explain to the class that within teams they will be creating a calendar for the year displaying the holidays and writing brief descriptions of the holidays.

2. Divide the class into **home** teams of four members and have them count off by fours.

3. Assign all number ones within the **home** teams the months of January, February, and March. Assign all number twos the months of April, May, and June. Do the same for number threes and four's within the **home** teams.

4. Instruct the adult learners to leave their **home** teams and form an **expert** team with those adult learners who have the same number. Distribute the names of the holidays that fall in each three month period to the **expert** teams. Pass out books describing the different holidays and/or other holiday materials.

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6. Request that all **expert** team members peruse the holiday materials, take turns reading aloud the descriptions of different holidays which fall within the three months they were assigned. All members of the team listen to the information and help each other with the vocabulary and content. At this point, ask each team member to summarize the **expert** team's descriptions of the holidays including the date of the holiday and how and why it is celebrated.

7. After all the holidays have been summarized, the **expert** team members return to their **home** teams. Using a round robin approach and starting with the month of January, the **home** team members share their holiday summaries and edit according to the team's suggestions.

8. Distribute the handouts, *Holidays for the Month of* _____. Each member of the **home** team receives three handouts. The members fill in the month at the top of the handout, write a summary of each holiday including how and why it is celebrated, and fill in the names of the holidays and appropriate dates at the bottom.

9. The instructor gathers the **home** teams' composite calendars. The calendars can be displayed, copied, and/or distributed to all adult learners.

Handouts Blank calendar pages

Text Suggestions

Kennedy, James H. *Celebrate With Us*,Lincolnwood, Illinois Contemporary Books 1997
Krulik, D., Zaffran, B., Everyday English Book 4 second edition National Textbook Company, 1992
Drews, D., Looking at American Holidays, National Textbook Company, 1988
Children's books from your area library

HOLIDAYS FOR THE MONTH OF _____

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

COOPERATIVE LEARNING ACTIVITY FOR MATHEMATICS

Structure
Expert Jigsaw - A cooperative learning structure in which adult learners are divided into home and expert teams.

Directions for Structure
The class is divided into **home** teams. The lesson is introduced to all home teams simultaneously. The home teams are then divided into **expert** teams. Each student on the expert team specializes and masters one aspect of the lesson. All learners return to their **home** teams to complete another handout which encompasses all aspects of the lesson.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Group processing

Lesson Title: INTRODUCTION TO ALGEBRA UTILIZING EXPERT JIGSAW

Content Area Mathematics

Category Intermediate ABE and GED

Time 1 to 1.5 hours

Directions for Activity

1. Divide the adult learners into **home** teams of three members. Within their home teams, the students are introduced to algebraic variables as it relates to addition and requested to write algebraic statements in addition.

2. Adult learners complete handout #1 in their **home** teams.

3. Have the adult learners count off by threes. All number ones form an expert team, all number twos form an expert team, etc. Each expert team will focus on a different aspect of algebraic variables related to whole numbers: subtraction, multiplication or division. These are the **expert** teams. One expert team works on the subtraction handout # 2, another expert team works on the multiplication handout 3#, and the third expert team works on the division handout #4. Adult learners meet in their expert teams to exchange information and master the material.

4. Adult learners return to their **home** teams and complete handout #5 together which encompasses all aspects of how whole numbers relate to algebraic variables.

Additional Ideas
Expert Jigsaw works well on math concepts where functions are involved. Decimals, geometry, and routine drills are all applicable.

Handouts Attached

Handout #1	Addition	Handout #4	Division
Handout #2	Subtraction	Handout #5	Evaluation
Handout #3	Multiplication		

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INTRODUCTION TO ALGEBRAIC EXPRESSIONS
ADDITION
HANDOUT #1

COMPLETE THE FOLLOWING:

1. $2 + ? = 4$

   $? =$

2. $3 + ___ = 6$

   $___ =$

3. $4 + \triangle = 6$

   $\triangle =$

4. $5 + x = 10$

   $x =$

5. $2 + n = 4$

   $n =$

6. $3 + y = 6$

   $y =$

7. $4 + x = 4$

   $x =$

8. $5 + y = 10$

   $y =$

9. $5 + y = 5$

   $y =$

WRITE ALGEBRAIC STATEMENTS FOR EACH OF THE FOLLOWING:

Example: A number, n, plus 3 = n + 3

1. A number, x, is increased by 12.

2. 0 plus a number, y.

3. Two numbers, x and y, are combined.

4. Four numbers, a, b, c, and d, are added together.

5. A number, x, is added to a number, y.

INTRODUCTION TO ALGEBRAIC EXPRESSIONS
SUBTRACTION
HANDOUT #2

COMPLETE THE FOLLOWING:

1. ? - 2 = 2
   ? =

2. ____ - 3 = 3
   ____ =

3. △ - 4 = 4
   △ =

4. n - 5 = 5
   n =

5. b - 2 = 4
   b =

6. d - 6 = 2
   d =

7. x - 1 = 0
   x =

8. x - 0 = 6
   x =

9. y - 0 = 7
   y =

WRITE ALGEBRAIC STATEMENTS FOR EACH OF THE FOLLOWING:

Example: "x" decreased by 5 = x - 5

1. 5 less than a number, x.

2. The difference between 2 numbers, x and y.

3. A number, x, is decreased by 10.

4. 68 less than a number, n.

5. Decrease a number, y, by 25.

INTRODUCTION TO ALGEBRAIC EXPRESSIONS
MULTIPLICATION
HANDOUT #3

(NOTE: WHEN A NUMBER AND A LETTER ARE NEXT TO EACH OTHER, THE "TIMES" SIGN (X) IS IMPLIED. FOR EXAMPLE, "2a" IS 2 TIMES a; "2x" IS 2 TIMES x.)

COMPLETE THE FOLLOWING:

1. $2 \times ? = 4$
   $? =$

2. $____ \times 3 = 6$
   $____ =$

3. $4 \times n = 4$
   $n =$

4. $2x = 4$
   $x =$

5. $2b = 6$
   $b =$

6. $4n = 4$
   $n =$

7. $10x = 0$
   $x =$

8. $6x = 6$
   $x =$

9. $6y = 0$
   $y =$

WRITE ALGEBRAIC STATEMENTS FOR EACH OF THE FOLLOWING:

Example: The product of 3 and an unknown number, n = 3n

1. 12 times a number, y.

2. The product of 5 and a number, n.

3. The product of two unknown numbers, x and y.

4. A number, x, is multiplied by 5.

5. A number, y, is multiplied by 1. (Hint: any number times 1 is that number--for example, 5 times 1 = 5; 3 times 1 = 3.)

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INTRODUCTION TO ALGEBRAIC EXPRESSIONS
DIVISION
HANDOUT #4

(NOTE: A SLANTED LINE, "/" MEANS "DIVIDED BY". OTHER SYMBOLS, SUCH AS A HORIZONTAL LINE, ALSO REPRESENT "DIVIDED BY".)

COMPLETE THE FOLLOWING:

1. 10/? = 5
   ? =

2. ?/5 = 2
   ? =

3. ?/1 = 4
   ? =

4. x/2 = 4
   x =

5. 5/b = 1
   b =

6. n/10 = 2
   n =

7. 15/x = 3
   x =

8. 10/y = 2
   y =

9. y/5 = 5
   y =

WRITE ALGEBRAIC STATEMENTS FOR EACH OF THE FOLLOWING:

Example: A number, n, divided by 5 = n/5.

1. A pizza (the pizza is "p") is divided by 8 people.

2. $20 is divided by an unknown number of children, "c".

3. A number, r, is divided by 30.

4. 30 is divided by a number, r.

5. An unknown number, x, is divided by x. (Hint: any number divided by itself is 1.)

INTRODUCTION TO ALGEBRAIC EXPRESSIONS
EVALUATION
HANDOUT # 5

Write the algebraic expression for each of the following problems. The person who was in the subtraction expert team should explain the subtraction problem, the person who was in the multiplication expert team should explain the multiplication problem, and the person who was in the division expert team should explain the division problem. Everyone should do the addition problem #2 and problem #5.

1. A group of people was supposed to go on a trip, but 5 did not go. Write the expression that shows how many people did go on the trip.
(Subtraction)

2. Larry ate "n" pies on Monday and "p" pies on Tuesday. Write the expression that show how many pies he ate altogether.
(Addition)

3. If each pizza costs $5, write the expression that shows how much "r" pizzas cost.
(Multiplication)

4. A family of 5 divided "m" amount of m&m's. Write the expression that shows how much each person received.
(Division)

5. If $x = 6$ and $y = 3$, complete the following: (Everyone)

A. $x + y =$ B. $3x =$ C. $x - y =$ D. $x/y =$

COOPERATIVE LEARNING ACTIVITY FOR MATHEMATICS

Structure
Expert Jigsaw - A cooperative learning structure in which individuals become experts on a particular topic and then share their knowledge with the other team members.

Directions for Structure
Put adult learners into **home** teams. Assign a specific task to each adult learner within the team. Then have the adult learners with similar tasks form teams of their own, **expert** teams. Distribute materials, etc. Allow time for each expert team to complete their tasks. Adult learners are then asked to return to their **home** teams where they take turns sharing their newly acquired knowledge to complete a new assignment.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction
Team processing

Lesson Title: PROBABILITY, RATIO, AND PROPORTION

Content Area	Mathematics
Category	Intermediate ABE and GED
Time	2 hours
Materials	Dice, quarters, and playing cards

Directions for Activity

1. Introduce probability, ratio, and proportion with the class as a whole. Explain that the class will be solving math problems related to probability, ratio, and proportion. These three concepts are similar and can be learned independently, but will be more useful if learned simultaneously.

2. Divide the class into **home** teams of three members.

3. Assign a different math problem solving topic to each member within the home team. For example, one member is responsible for solving math problems related to probability, another for ratio, another for proportion.

4. Instruct the adult learners who have similar math problem solving topics to leave their home team and form **expert** teams. All adult

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learners responsible for solving math problems related to probability will work together, all adult learners responsible for solving math problems related to ratio will work together, etc.

6. After expert teams are formed, assign members the following roles: leader; recorder; time keeper; and encourager. The leader keeps the team on task and reads the handouts. The recorder takes notes for the team and writes the team members' responses. The time keeper makes sure the assignment is completed on time. The encourager encourages all members of the team to participate. The encourager often needs explicit positive examples of what needs to be said to the team to play the role. For example, the encourager might say to one of the team members who has refrained from sharing ideas, "And what do you think?" or "Do you think this will work?" The class can brainstorm creating positive statements, also. Their ideas are often the best and the ones which will get used.

7. Distribute handouts (see attached sheet)to each expert team and instruct the probability expert team to study the probability handout and to solve the probability problem. Instruct the ratio expert team to study the ratio handout and to solve the ratio problem. Instruct the proportion expert team to study the proportion handout and to solve the proportion problem. Allow enough time for all expert teams to complete their task.

8. Instruct adult learners to leave their expert teams and return to their home teams. Give each home team a sheet of problems to be solved which include all three math problem solving topics: probability, ratio, and proportion. Instruct the home teams to complete the assignment. Each adult learner is responsible for overseeing his/her area of expertise. Again assign roles: leader; recorder; time keeper; and encourager.

9. After the adult learners in their home teams have completed the assignment, use the following questions for group processing with the whole class.
   - What did you learn while you were working in the expert teams?
   - What did you share while you were working in the expert teams?
   - What did you learn while you were working in your home teams?
   - What did you share while you were working in your home teams?

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PROBABILITY-is the study of chance—the likelihood of an event happening.

Formula: probability of a favorable outcome= $\frac{\text{Number of favorable}}{\text{total number of possible}}$

Probabilities are expressed as numbers (usually common fractions) ranging from 0 to 1 or as percents from 0% to 100%.

Study this example:

What is the probability that a spinner pictured below will stop on green?

Step 1. Notice there are 4 possible outcomes, but only 1 favorable outcome—only 1 green section.
Step 2. Write the probability fraction. 1/4 (one in four)

ANSWER: The probability of a green outcome is 1/4, or 25%
On the average, only 1 spin in 4 will stop on green.

There are 6 faces on a die. Each side is equally likely to be up after the die is tossed.
A). What is the probability of rolling a 4 with on toss of the die?
B). What is the probability of rolling an even number with one toss of the die?

Step 1. Notice there are 6 possible outcomes, but only 1 favorable outcome——only 1 chance to get a 4.
Step 2. Write the probability for part A. 1/6

ANSWER: The probability of a 4 outcome is 1/6, or 16%
On the average, only 1 toss in 6 will come up 4.

Now you solve part B!

RATIO-is a comparison of two numbers. For example, it there are 8 woman an 5 men in your math class, the ratio of men is "8 to 5."

You can write the ratio " 8 to 5" using symbols in two ways:

- as a fraction, write 8 to 5 as 8/5.
- with a colon, write 8 to 5 as 8:5

Steps to follow in a ratio problem:

1. Reduce a ratio to lowest terms by rewriting as fraction and then reduce.
2. Write a whole number ration with a denominator of 1 and leave as is. - -
3. Do not write an improper fraction ratio as a mixed number, leave as is.
4. Rewrite a complex ratio as an equal fraction that has only whole numbers.

Study this examples closely:

Wanda earns $1,200 per month. If she pays $300 each month in rent, what is the ratio of her rent to her income?

Step 1: write the ratio of rent to income. Reduce

RENT/INCOME=$300/$1200=1/4 or 1:4 or 1 to 4

On a test of 40 questions, Thurman answered all of the questions and got 6 wrong. What is the ratio of his correct answers to his incorrect answers?

Step 1: Determine how many questions Thurman answered correctly: 40-6=34 correct.
Step 2: Write the ration of correct to incorrect.
Correct/incorrect=34/6-17/3 or 17:3 or 17 to 3

SOLVE THE FOLLOWING PROBLEM:

A new compact car gets 48 miles to the gallon during highway driving an d 32 miles to the gallon during city driving.

A). What is the ration of this car's city mileage to highway mileage?
B). What is the ratio of this car's highway mileage to city mileage?

PROPORTION—IS A STATEMENT THAT TWO RATIOS ARE EQUAL. SINCE RATIOS CAN BE WRITTEN AS FRACTIONS THE TWO RATIOS IN A PROPORTION CAN BE WRITTEN AS TWO EQUAL FRACTIONS.

You write a proportion in symbols in either of two ways:

1). With colons, 2:3=6:9
2). As equal fractions, 2/3=6/9

In a proportion , the cross products are equal. To find the cross products, cross multiply. Multiply each numerator by the opposite denominator.

CROSS MULTIPLICATION

$$\frac{2}{3} \quad \frac{6}{9}$$

EQUAL CROSS PRODUCTS

2(9)=3(6)
18=18

Study this example:

A light blue paint is made by mixing 2 parts of blue paint to 5 parts of white paint. How many gallons of blue paint should be mixed with 24 gallons of white paint to make this light blue color?

Step 1. Write a proportion where each ratio is blue/white.
Let x stand for the unknown number of gallons of blue.
2/5=x/24

Step 2. Cross multiply; then solve the resulting equation for x.
5x=2(24)=48
x=48/5

ANSWER: 9.6 gallons

SOLVE THE FOLLOWING PROBLEM:

A tropical punch recipe calls for 3 parts 7-Up to 4 parts Hawaiian Punch. How much 7-Up should be added to 3 quarts of Hawaiian Punch to make the mixture?

Testing your knowledge:

Directions: answer the following questions based on the information that you have gathered in your groups. Show all of your work and circle your answer.

1.) A computer store had 4 full-time employees and 6 part-time employees. What was the ratio of full-time employees to the total number of employees?

2.) A recipe calls for 2 cups of sugar and 3 eggs. What is the ratio, in lowest terms, of eggs to cups of sugar?

3.) A cleaning solution label says to mix 1 part solution to 5 parts water. How many gallons of solution should be mixed with 20 gallons of water?

4.) A clerical assistant earns $45.20 in 8 hours. At this rate, how much does he ern in 40 hours?

5.) There are 12 dogs and 15 cats at a pet shop. If one of these animals is chosen at random, what is the probability that it will be a dog?

6.) On one roll of a die, what is the probability of getting a number less than 5?

COOPERATIVE LEARNING ACTIVITY FOR ENGLISH AS A SECOND LANGUAGE

Technique
Role Assignments - Role assignments reinforce the message of positive interdependence because success depends on each group member performing his or her role.

Directions for Structure
Assign each learner a role within the team: reader, recorder, monitor/leader as explained below in the Directions for Activity. The roles must be explained by the instructor and clearly understood by the adult learners.

Basic Elements Employed
Positive interdependence
Individual accountability
Face-to-face promotive interaction

Lesson Title: NEW VOCABULARY IN USE

Content Area	Reading, Writing, Speaking, and Listening
Category	High-beginning and/or Intermediate ESL
Time	1 hour

Directions for Activity

1. Instructor prepares a handout listing fifteen (15) target vocabulary words in left-hand column and a series of sentences to be completed in the right-hand column. (See handout following activity for example.) Target words from pre-determined, specific units of study and choose context of a practical, everyday nature.

2. Instructor assigns roles within teams of three (3) or four (4) members and explains tasks associated with each role: **reader, recorder, monitor, and leader. Tip:** Using 3" by 5" index cards, write out the roles, the tasks associated with the roles, and hand them out to the team members.
   - **Reader** - reads aloud the list of target vocabulary words.
   - **Recorder** - writes the word chosen by the members of the group to complete the sentences.
   - **Monitor** - keeps the group on task and checks answers for scoring.
   - **Leader** - generates discussion within the group.

3. Instructor distributes handouts to each member of the team and explains that each team will turn in only one answer sheet to the instructor at the completion of the assignment.

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Role Assignments
NEW VOCABULARY IN USE

4. Teams read over the handout and work together within their assigned roles to complete the activity.

5. Team members are requested to put their individual names on the team's answer sheer and give it to the instructor. The instructor immediately corrects the one answer sheet from each team, scores it, records a grade, and returns it to the team leader for team review and revision.

6. When each team has completed its own review and revision, all teams interact exchanging ideas and suggestions.

7. Instructor collects the one signed answer sheet, makes copies, and files an answer sheet in the work folders of each adult learner.

Additional Ideas

Use vocabulary and create sentences using: a seasonal or calendar theme; names of fruits and vegetables or any food groups studied; specific places in the community such as the bank, the post office, or the library.

Handouts Attached

Handout Intermediate Vocabulary Study

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Role Assignments
NEW VOCABULARY IN USE

INTERMEDIATE VOCABULARY STUDY

Use the following "new vocabulary" words in context

- Firmness — His handwriting is not _____.
- Fairness — I met her at the mall by _____.
- Fatigue — Smoking really _____ a lot of people.
- Bounce — It is sometimes difficult to _____ our problems.
- Believable — This judge treats all citizens with _____.
- Bother — _____ can _____ us feel sick.
- Calm — I was _____ by the un_____ ending of the story.
- Coincidence
- Count on — Children love to _____ a ball with their friends.
- Fascinated — It is best to _____ of others' personal business.
- Legible — We all have so many things to _____ everyday.
- Figure out — After solving a problem, we often feel very _____.
- Make or do — Don't _____ those who seem different.
- Keep out — Students can usually _____ their counselors to give them good advice.
- Make fun of — The boss manages this company with _____.